



## REACTION TIME OF RURAL AND URBAN FEMALE SOCCER PLAYERS IN WEST BENGAL: A COMPARATIVE STUDY

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### ABSTRACT

**Introduction:** Soccer require that players show the highest possible level of reaction to stimuli in both the central and peripheral fields of vision, because selecting key information about the opponent's movements is only efficient if the athlete observes the opponent's entire body and its surroundings. The main aim of this study was to compare reaction time ability of rural and urban women soccer player. **Material and methods:** The study participants comprised 60 women soccer club player in different club of West Bengal in which 30 rural and 30 urban girls aged  $10.27 \pm 1.37$  were recruited through random sampling method. The study involved three ability tests from the Multipurpose Reaction Time Apparatus: the Audio Reaction Time, the Visual Reaction Time and the Tactile Reaction Time test. **Results:** In order to analyze the data independent t- test was used to analyze the data at 0.05 level of Significance and investigator observed the significant different between Rural and Urban women soccer players ( $p < 0.05$ ). **Conclusions:** Rural women soccer players were excelled in reaction time ability than urban women soccer players. The life style of rural women soccer players likely, was the best reason for their better reaction time.

**KEYWORDS:** Reaction Time, Rural, Urban, Women Soccer Club Player

### INTRODUCTION

The urban people with the growth of cities has come a great transformation in the living habits of society. The city is the hub of much social life, and it influences its standards. Intellectual growth and habits, moral codes and conditions, behavior patterns and cultural conditions resolve around it. New communities, new group, new ethnic relations and a multitude of classes make of the city an intricate and complex unit of modern society. Many factors affect the student's activities and consist of environment, lifestyle, socio-economic status, different geographic regions, parent, living in city and country, cultural influences, health conditions, facility ported available, physical education classes, transportation to the place of physical training and regular participation in sport and physical activity can be named (Seryozha, et al 2013; Anupamakar et al 2013).

Human body has its response to various external environmental stimuli. Human body gives a desired & purposeful voluntary response to different types of stimuli. Reaction time is the interval time between the presentation of a stimulus and the initiation of the muscular response to that stimulus (Devi & Madhuri, 2017). There are a few factors that can affect reaction time in sports and life in general. These include genetics, age, sex, training background, cognitive abilities, and body temperature. Reaction is a purposeful voluntary response to stimulus (Jyothi & Vernekar 2016). Reaction time is the intermission time between the presentation of a stimulus and the beginning of the muscular reaction to that stimulus. Reaction time measurement helps in determining sensory motor connection and performance of an individual. It determines the alertness of a person because how quickly a person responds to a stimulus depends on his reaction time. Physical activity

increases the alertness of the body and hence is an important parameter in cases of visual and audio reaction time. (Debnath, S & Bhowmick, S 2005). This fact provided an impetus to investigate the reaction time tasks for auditory and visual stimuli between normal healthy controls and physically active controls (Khatrri & Ganvir, 2019). Reaction time is affected by factors such as age, gender, number of simultaneous stimuli, nutrition, physical activity, training and physical fitness and fatigue (Morehouse & Miller 1976; Spirdiso 1975; Tripo 1965). It is known that athletes have better reaction times than non-athletes (Moka et al. 1992). Reaction time is a decisive factor affecting success in sporting competitions. The reaction times of athletes in different sports show variations (Moka et al. 1992).

Like we observe that in rural areas children are indulging in minor, indigenous activities and field games like football, kabaddi, kho-kho, hockey, wrestling, athletics etc. whereas, in urban we find children playing basketball, swimming, badminton, tennis, squash, golf etc. The main cause of difference is the availability of facilities and financial support of parents. A great deal of success in athletic activities, especially in soccer, depends on the correct use of these processes. For example, during a soccer match, athletes are often required to react quickly to a visual and/or sound stimulus (the direction of the ball, movements and advances of other players, the whistle of the referee, the tendency of the coach to prefer a certain tactic, etc.) such that quick and correct judgment can influence not only the success of the particular maneuver but also the results of the matches (Spierer, Petersen, & Duffy, 2010). Soccer is one of the most popular sports in the world. In order to reach the professional level athletes need to improve the multiple factors that are determinants of their development, such as anthropometrical and physical traits (Gil, Ruiz, Irazusta, Gil,

& Irazusta, 2007; Reilly, Franks, & Bangsbo, 2000), cognition (Vestberg, Gustafson, Maurex, Ingvar, & Petrovic, 2012), and tactical and technical characteristics (Costa, Garganta, Greco, Mesquita, & Seabra, 2010). Therefore, the requirement of an ability to react quickly to environmental stimuli makes this quality critical to the success of a soccer player. In light of this concept, the reaction time (RT) to visual and sound stimulus is frequently used as an indicator of an athlete's general ability (Hirose, Hirano, & Fukubayashi, 2004). The RT can be conceptualized as the interval between the presentation of an anticipated stimulus and the beginning of the athlete's movement. This interval represents the accumulation of the three stages of information processing: identification, selection and response programming. The interval between the beginning and the end of the motor movement is called movement time (Schmidt & Wrisberg, 2010). In addition, the RT can be differentiated into three types according to the number of stimuli and possible responses: simple, choice and discriminative (Magill, 2000). Reaction time can be broken down into three parts. The first is perception time: the time for the application and perception of the stimulus and giving the necessary reaction to it. The second is decision time, which signifies the time for giving an appropriate response to the stimulus. The third is motor time, which is the time for compliance to the order received (Tripo 1965; Teichner 1954). Reaction time is the interval between the onset of a signal (stimulus) and the initiation of a movement response (Magill 1998).

The purpose of this study was to compare the rural and urban female students and to find out which of these two categories is better in response time so as one can improve the standard and level of physical fitness in rural and urban female soccer players.

## MATERIAL AND METHODS

**Selection of Subjects:** The subjects of the present study were selected randomly (purposive) from different clubs of North 24 parganas district of West Bengal. The researcher selected 60 female soccer players aged between 7-12 years, divided into two groups, rural group (RG) consisting of 30 female soccer players (N-30), and urban group (UG) consisting of 30 female soccer players (N-30).

|                  |        |        |
|------------------|--------|--------|
| Age (yr)         | 10.27  | ± 1.37 |
| Height (cm)      | 128.14 | ± 6.96 |
| Body weight (kg) | 29.2   | ± 3.88 |

\*Data are presented as mean ± standard deviation.

**Table 1. Physical profiles of the 60 female soccer players\***

## Selection of Variable and Their Criterion Measures:

Table 2 presents the components of reaction time which were selected for the present study and were measured.

| S. No. | Variables             | Criterion measures                   |
|--------|-----------------------|--------------------------------------|
| 1      | Audio Reaction Time   | Multipurpose Reaction Time Apparatus |
| 2      | Visual Reaction Time  |                                      |
| 3      | Tactile Reaction Time |                                      |

**Table 2: Selected variables and their criterion measures**

## Administration of the test

**Purpose:** The Purpose of the study was to compare the reaction abilities (audio, visual and tactile) between rural and urban female soccer players.

**Equipment:** Multipurpose Reaction Time Apparatus

**Scoring:** Three trials were permitted to each subject for every stimulus (audio, visual and tactile) and the average of the three timings was taken as an individual score.

## Statistical Technique:

The data analyzed and compared with the help of statistical procedure in which arithmetic mean, standard deviation and independent t-test used to compare the data. Data was collected, compiled and analyzed by using statistical package of social science (SPSS) software version 26.0. Significance was set at the  $p < 0.05$  level.

## RESULTS

The purpose of this study was to compare the reaction ability of the rural and urban women soccer players. To achieve this purpose, the data collected in this study were put to statistical analysis and the results of which are presented in this chapter.

| S. No. | Variables  | Groups | Number | Mean  | Std Deviation | 't' Value | p Value |
|--------|------------|--------|--------|-------|---------------|-----------|---------|
| 1      | RT_Audio   | Rural  | 30     | 0.243 | 0.021         | *2.081    | 0.042   |
|        |            | Urban  | 30     | 0.256 | 0.027         |           |         |
| 2      | RT_Visual  | Rural  | 30     | 0.255 | 0.026         | *2.322    | 0.024   |
|        |            | Urban  | 30     | 0.270 | 0.025         |           |         |
| 3      | RT_Tactile | Rural  | 30     | 0.264 | 0.033         | *2.214    | 0.031   |
|        |            | Urban  | 30     | 0.282 | 0.031         |           |         |

\* Statistically significant ( $p < 0.05$ ).

**Table 3: Comparison of Reaction Ability of Rural and Urban Soccer Female players**

Subjects' mean age, height and body weight were respectively (Table 1). Independent t-test result showed that there were significant differences found between the rural and urban respondents in respect of their reaction times ( $p < 0.05$ ) (Table 3). Subjects' 't' scores for audio, visual and tactile reaction times of the Rural and Urban Soccer female players were 2.081, 2.322 and 2.214 respectively. With the respect to the mean the results of the reaction ability in rural students were lower than urban students. It means that rural Soccer female players have better reaction ability than the Urban Soccer female players.

## DISCUSSION

The purpose of this study was to compare the reaction ability of the rural and urban women soccer players. Reaction ability of rural women soccer players were better than urban women soccer players. The above results are in agree with Stavrou and Kakkos (2002) who found that the major reasons for participation of women were to improve their health and mood, while Zervas (1999) indicated the importance of physical activity for people's psychological health. Probably the causes life style of people in rural, activity level, body composition, less fat, better physical fitness in rural people lead to increase their reaction quality. Chaudhary (1998) studied the difference in physical fitness of urban and rural students studying in class IX and X and found that rural students were better in physical fitness than urban students. Uppal and Sareen (2000) conducted a study to find out the comparison on cardiovascular fitness between rural and urban students and revealed that students with rural background performed better than that of their counterparts in urban area.

The result of study showed that rural students were better than urban students, and the results of this contradict with findings of Singh Kumar (2012) and Zinal Fekry (2012) but were agree with the finding of manumit (2010). Because of higher fitness and more activities in rural people than urban people,

cardio-respiratory endurance of rural students were higher than urban students. This result was in agreement with findings of **ZainalFekri (2012)**, **Sinkukumar & Prashant (2011)** but was opposed with findings of **Deyou (2014)** likely, the causes of contradiction were age and geographical location of individuals. Life style of people in rural, activity level, body composition, less fat, better physical fitness in rural people lead to increase their reaction ability.

In reaction time, there was a significant difference in rural and urban women soccer players. Rural group were better than urban group in reaction time because of dietary habit, nutrition and environmental conditions with proper body balance were responsible for this type of result.

## CONCLUSION

In conclusion the results of the present study confirm that female rural students are comparatively better than urban female players. Rural female students are superior to urban female students in Audio Reaction time, Visual Reaction time and Tactile Reaction time. This shows that regular energetic activity produces physical fitness improvements. Village life style is more active in nature than the life in urban areas which produced a high level of physical and physiological functioning in rural residents.

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